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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,294	08/27/2003	Kazunori Suzuki	2635-172	4463

23117 7590 01/31/2007  
NIXON & VANDERHYE, PC  
901 NORTH GLEBE ROAD, 11TH FLOOR  
ARLINGTON, VA 22203

EXAMINER
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OLSEN, KAJ K

ART UNIT	PAPER NUMBER
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1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/31/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/648,294

Applicant(s)

SUZUKI, KAZUNORI

Examiner

Kaj K. Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 6-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8-27-03;3-10-06;5-2-06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of group I in the reply filed on 1-3-2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 6-16 are withdrawn from further consideration as being drawn to a non-elected invention.

### ***Specification***

3. The title of the invention should be amended to reflect that the claims are drawn to just a gas sensor element and not to a method of manufacturing a gas sensor element.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayakawa et al (USP 4,722,778).
6. Hayakawa discloses a gas sensor element comprising a solid electrolytic sheet (12, 32) provided with a pair of electrodes ((14, 16) or (34, 36)) so as to constitute an electrochemical

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cell. Hayakawa further discloses another sheet (32 or 12 respectively) disposed so as to oppose the solid electrolyte sheet so as to define a gas chamber 52 therebetween. Hayakawa further discloses a spacer 50 disposed in the gas chamber between the solid electrolyte sheet (12, 32) and the another sheet (32, 12) and a support member 60 disposed in the gas chamber. See fig. 1 and col. 3, l. 4 through col. 4, l. 65, especially col. 4, ll. 44-65. Although the support member is not explicitly disclosed as being for supporting against a pressing force in a direction of lamination, the support 60 of Hayakawa would clearly be able to support against such a pressing force. Furthermore, see col. 1, ll. 48-53.

7. With respect to the support being along a central portion of the gas chamber, the middle row of support 60 in fig. 1 is along a central portion of the gas chamber.

8. With respect to the sectional area %, Hayakawa teaches that the support can occupy 0.8-20% of the sectional area of the gas chamber. See col. 4, ll. 49-65 and note that the gas chamber area and electrode areas appear to be the same.

### *Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (US 2001/0025788 A1) in view of Hayakawa and/or WO 01/16588 (hereafter "WO '588"). For

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the teaching of WO '588, the examiner will rely on the English disclosure of Scheer et al (USP 6,767,442).

11. Tanaka discloses a gas sensor element comprising a shield sheet (upper portion of layer 52), a first solid electrolytic sheet 53 constituting a monitor cell 6 and a sensor cell 3, a first spacer (lower portion of layer 52) disposed between the shield sheet and first solid electrolytic sheet so as to form a first reference gas chamber. See fig. 2 and paragraphs 0064 and 0065. Tanaka further discloses a second solid electrolytic sheet 55 constituting a pump cell 2, a second spacer layer 54 between the first and second solid electrolytic sheets so as to form a measurement chamber (11, 12), a heater sheet 15 provided with a heater element and a third spacer 56 disposed between the second solid electrolytic sheet and the heater sheet so as to form a second reference gas chamber 14. See fig. 2 and paragraphs 0128 and 0130. Tanaka does not explicitly disclose the presence of support members disposed in the first and second reference gas chambers and gas measurement chamber. Hayakawa discloses the use of support elements 60 in a sensor gas measurement chamber to prevent shrinkage or distortion of the solid electrolytes as a result of the firing of the sensor. See fig. 1, col. 1, ll. 48-53 and col. 3, l. 61 through col. 4, l. 3. Furthermore, WO '588 discloses the addition of a support element 28 inside the reference gas chamber 17 in order to make the sensor more rigid. See fig. 4 and col. 3, ll. 12-18. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Hayakawa or WO '588 for the sensor element of Tanaka so as to provide a sensor where the sensor layers are not warped or distorted as a result of the firing process or to provide a sensor that is more rigid than an unsupported sensor. With respect to placing these support members in all three of the first and second reference gas chambers and the measuring

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gas chamber, Hayakawa discloses placing a support member in the measurement gas chamber while WO '588 discloses the use of support elements in the reference gas chamber.

Furthermore, one possessing ordinary skill in the art would recognize that the support elements of Hayakawa or WO '588 could be placed in all of the chambers of Tanaka to ensure that the sensor of Tanaka is not warped or distorted by the presence of any of the chambers (like disclosed by Hayakawa) or to ensure that the entire sensor of Tanaka is rigid (like disclosed by WO '588).

12. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murase et al (USP 5,780,710) in view of Hayakawa and/or WO '588. Again for the rejection with WO '588, the examiner is relying on the English language disclosure of Scheer.

13. Murase discloses a gas sensor element comprising a first solid electrolytic sheet 4a constituting a first pump cell (16, 18), a second solid electrolyte sheet 4c constituting a second pump cell (28, 30), a monitor cell (22, 24), and a sensor cell (36, 38), a first spacer 4b disposed between electrolytic sheets 4a and 4c so as to form a gas measurement chamber (6, 7, 8), a heater sheet (4e, 4f) provided with a heater element 42, and a second spacer 4d disposed between the first and second electrolytic sheets and the heater sheets so as to form a reference gas chamber

10. See fig. 3b and col. 5, l. 11 through col. 8, l. 9. Murase does not explicitly disclose the present of support members disposed in the first and second reference gas chambers and gas measurement chamber. Hayakawa discloses the use of support elements 60 in a sensor gas measurement chamber to prevent shrinkage or distortion of the solid electrolytes as a result of the firing of the sensor. See fig. 1, col. 1, ll. 48-53 and col. 3, l. 61 through col. 4, l. 3.

Furthermore, WO '588 discloses the addition of a support element 28 inside the reference gas

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chamber 17 in order to make the sensor more rigid. See fig. 4 and col. 3, ll. 12-18. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Hayakawa or WO '588 for the sensor element of Murase so as to provide a sensor where the sensor layers are not warped or distorted as a result of the firing process or to provide a sensor that is more rigid than an unsupported sensor. With respect to placing these support members in the measurement and reference gas chambers, Hayakawa discloses placing a support member in the measurement gas chamber while WO '588 discloses the use of support elements in the reference gas chamber. Furthermore, one possessing ordinary skill in the art would recognize that the support elements of Hayakawa or WO '588 could be placed in all of the chambers of Murase to ensure that the sensor of Murase is not warped or distorted by the presence of any of the chambers (like disclosed by Hayakawa) or to ensure that the entire sensor of Murase is rigid (like disclosed by WO '588).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753  
January 29, 2007



**KAJ K. OLSEN**  
**PRIMARY EXAMINER**